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REPORT

ON

THE SOVIETS AND THE SEAS

REPORT OF A CONGRESSIONAL DELEGATION TO POLAND AND THE SOVIET UNION

AUGUST 4, 1966.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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THE SOVIETS AND THE SEAS

AUGUST 4, 1966.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

MR. GARMATZ, from the Committee on Merchant Marine and Fisheries, submitted the following

REPORT

of a Congressional Delegation to Poland and the Soviet Union

LETTER OF TRANSMITTAL

AUGUST 4, 1966.

Hon. JOHN W. MCCORMACK,
Speaker of the House,
U.S. House of Representatives, Washington, D.C.

DEAR MR. SPEAKER: There is transmitted herewith a report entitled "The Soviets and the Seas," submitted by a subcommittee appointed by me to visit Poland and the Soviet Union to inspect the fishery, oceanographic, and merchant marine activities behind the Iron Curtain. The attached report was ordered reported to the House this day by the full Committee on Merchant Marine and Fisheries, in executive session.

Sincerely,

EDWARD A. GARMATZ, *Chairman.*

LETTER OF SUBMITTAL

JUNE 23, 1966.

Hon. EDWARD A. GARMATZ,
Chairman, Merchant Marine and Fisheries Committee,
U.S. House of Representatives,
Washington, D.C.

DEAR MR. CHAIRMAN: Having been assigned by you to form a congressional delegation to visit Poland and the Soviet Union to inspect the fisheries, oceanographic, and merchant marine activities behind the Iron Curtain, we the undersigned, submit the following report. It is our hope this report, its findings, conclusions, and recommendations will be of value to the committee and the Congress as they consider future legislation.

Respectfully submitted.

PAUL G. ROGERS.
HASTINGS KEITH.

THE SOVIETS AND THE SEAS

Report of a Congressional Delegation to Poland and the Soviet Union

January 1966

Representative Hastings Keith

AND

Representative Paul Rogers

COMMITTEE ON MERCHANT MARINE AND FISHERIES

H. Rept. 1809, 89–2——2

REPORT ON THE SOVIETS AND THE SEAS

SUMMARY

Introduction

In the face of a growing Soviet buildup in marine sciences and technology, two members of the Merchant Marine and Fisheries Committee were delegated by Chairman Edward A. Garmatz to visit behind the Iron Curtain to get a closer look at Soviet progress. Their purpose was both to gather more information as well as to draw the attention of Congress and the public to the fact that the Soviets are making rapid gains in this field and that our progress may well not be adequate for the challenge.

Most of the information was gathered through visits in the U.S.S.R. to the State Committee for Science and Technology, a policymaking body, to the Ministry of Fisheries, which directs and plans all fishery operations and development, and to the Institute of Oceanology, a center for basic research. Visits in Poland were made to the Ministry of Fisheries, the State Agency for Promotion of Maritime Trade (CENTRONOR), and two shipyards, at Gdynia and Gdansk, where much shipbuilding is done for the U.S.S.R.

Oceanography

The Soviets appear to have highly directed planning. Operating through a newly established group, the National Council for the Utilization of the Resources of the Sea, the State Committee on Science and Technology has central jurisdiction over the budget and planning of all oceanographic research and development programs. They strive for efficient allocation of resources and also provide an excellent means for channeling all important research work to user agencies.

The Institute for Oceanology is one of the U.S.S.R.'s major basic research institutes. Less than 2 years ago, according to visiting U.S. scientists, it was an inadequate facility without much freedom to explore in basic research. However, just recently the institute has been given new vitality by the appointment of a new director, more freedom from technological requirements in their research, and an enlarged budget.

The Soviets have over 200 oceanographic and hydrographic research vessels conducting research in every ocean of the world. They have navy submarines studying our own coast. Plans for deep sea research vehicles are apparently receiving priority attention at the moment. About 8,000 or 9,000 people are working full time in the Soviet oceanographic program, while we have only about 3,000. Their capability for collection of oceanographic data is the largest of any nation today.

The Soviet Union utilizes very effectively international organizations to serve its national purposes. They gain influence and information through these organizations. Moreover, they use their tech-

nological superiority for international good will by giving foreign assistance in oceanography.

The U.S. program is, relatively speaking, uncoordinated and fragmented among more than 20 different Government agencies. The one central body, the Interagency Committee for Oceanography, has not the statutory power to give much direction to the program. This country leads the Soviet Union in basic research at the moment, but we are lagging in the area of applied research. One of our major failings is an inadequate system of dissemination of information to user agencies and the general public.

Fisheries

Because of the totalitarian nature of the Soviet state, it is possible for the Soviet Ministry of Fisheries to control and plan all stages of the Soviet fishing industry, from fishing vessels to research institutes and processing plants. Moreover, Soviet fishing vessels can be used extensively for intelligence activities.

The Soviets are rapidly expanding their fishing industry and seem to have definite plans to build more and more large oceangoing trawlers and factory ships. With these, they will be spreading their fleets farther south. Under the present 5-year plan the Soviets would increase their catch by 50 percent by 1970.

Soviet fishing is a science. Some of the developments include farming the sea, artificial breeding of fish, elevators to help spawning fish upstream over dams and fish forecasting. They may soon get into the fish protein concentrate business. (This area is one where even though our technology is ahead, our bureaucratic redtape prevents our capitalizing on it.) If they were to produce this inexpensive and protein-rich powdered extract of fish in any large quantity, it would fit well into their extensive program of foreign fisheries assistance to underdeveloped nations.

The Soviet catch has grown 250 percent since 1953 while ours has declined. In 1965 their catch was 5.6 million tons of fish, 3.3 million tons more than ours. They unload thousands of tons of fish in underdeveloped countries while we have a balance-of-payments deficit in fishery products of $500 million.

Finally, much of our gear and most of our fishing fleet is outmoded and less efficient than the Soviets. With our higher labor costs, the cost of vessel construction in this country is more than double that in foreign countries.

Merchant marine

The Soviet fleet calls at 600 ports in 91 different countries with military and foreign aid cargoes as well as on passenger cruises. The Soviets' determination to make theirs a major world fleet is unquestionable. Some of the technological developments are focused on deepening navigable waters, modernizing their shipbuilding industry, totally automated ships and cargo handling, atomic icebreakers, and computers to plan routing of freight and ships.

The present Soviet fleet is over 8½ million deadweight tons and has, since 1960, been strengthened from 11th place among world fleets to 6th place. The Soviet target for 1980 is a fleet of 20 million deadweight tons. Today 464 or 24 percent of the total number of ships on order throughout the world are for the Soviets.

The goal of the Soviets is to be free from reliance on foreign shipping and to develop enough of their own to have a significant influence on world freight rates. They expect to be carrying 75 percent of their trade in Red-flag ships by the end of 1966. This compares with the United States which carries only 9 percent of its trade in American bottoms.

The United States is definitely lagging in the merchant marine. We had only 41 merchant ships on order at the beginning of 1966. In the previous year we accepted delivery of 16 ships while the Soviets accepted delivery of 129.

About 70 percent of our present fleet has had more than the 20-year reasonable lifespan for a ship. On the other hand, 80 percent of the Soviet merchant fleet is less than 10 years old.

Our budget for fiscal year 1967 indicates our concern for our Nation's relative strength is minimal. It calls for construction of only 13 new ships at most, yet we must charter foreign vessels to carry war materials to Vietnam.

Finally there appears to be an immediate shortage of manpower to man the ships. With the average age of the licensed work force at about 50, 44 percent will be in the retirement category in the next 3 years.

Conclusion

In short, our visit, though very brief, when coupled with our study of appropriate statistics and documents, leads us to an inevitable conclusion. The Soviets are, by design and in fact, progressing rapidly in the fishing and merchant marine industries, and in oceanography. We as a nation have cause for concern about our relative status in these areas, and must take immediate action if we are to compete with the Communist bloc. The population explosion makes it imperative that the resources of the sea be developed for the health and economy of all nations. We must play the lead role in finding and exploiting them for the benefit of all mankind.

Introduction

The Soviet challenge

In 1957, the Soviet Union electrified the world by launching the first space satellite. U.S. reaction was swift and our stepped-up space program soon challenged Soviet supremacy in this field. But, space flight was only one of several major scientific and technological programs inaugurated by the U.S.S.R. in the late 1950's. Even as technicians readied the first booster for sputnik, another decision was being made in the Kremlin to extend the maritime influence of this historically landlocked nation outward into the waters of the world.

This latter decision was not to be acheived through "spectaculars." Instead, it called for the buildup of a vast maritime capability: modern fleets of fishing, merchant and naval vessels; trained personnel to man these new fleets; and more importantly, a worldwide scientific quest for detailed information about the ocean environment in which the maritime operations of the future would be conducted.

To acquire this capability, the U.S.S.R. mobilized its resources and assigned a national priority commensurate with the importance given to this long-range program.

Over the past 10 years, the Soviet Union's concerted effort to master the seas has gained momentum. Although the free world has yet to feel fully the impact of this program, the U.S. Congress, and in particular the House Committee on Merchant Marine and Fisheries, has become increasingly concerned over the international economic and political implications of what now can be identified as a unified Communist thrust seaward. The committee has heard witnesses from Government, industry, and the scientific community voice concern over the deteriorating state of the U.S. fishing and merchant marine industries. It has studied with interest the reports of American delegations who have visited the Soviet Union, and noted, especially, opinions concerning the growth of Soviet oceanography and its continuing emphasis on the direct application of science to technology. The committee has worked closely with other congressional committees which have investigated relevant aspects of the Soviet effort: the Senate Commerce Committee's important Soviet fishing and merchant marine studies are a case in point.

("The Postwar Expansion of Russia's Fishing Industry", Jan. 23, 1964; and "The Growing Strength of the Soviet Merchant Fleet", Dec. 31, 1964; Senate Commerce Committee print, 88th Cong., 2d sess.)

As the scope and implications of the Soviet effort have some into sharper focus, the committee has sought to provide a sound legislative base upon which a U.S. oceanographic program could be built, not only to help meet the Soviet challenge, but to promote the security, welfare, and economic well-being of the American people. None of the attempts at basic legislation has been made law as of this writing, although Congress is agreed in general that more central direction of oceanography is needed.

The chairman of the House Committee on Merchant Marine and Fisheries, Representative Edward A. Garmatz, Democrat, of Maryland, in January 1966, authorized a delegation of two members of the Subcommittee on Oceanography, Representative Hastings Keith, Republican, of Massachusetts and Representative Paul Rogers, Democrat, of Florida, to visit the Soviet Union and Poland. It was recognized, of course, that the delegation could not investigate in entirety the Soviet maritime effort even if it were permitted access to key facilities and personnel. The delegation could, however, help stimulate renewed efforts on the part of Congress to accelerate U.S. efforts to embark on a truly national program to challenge the Soviet effort at sea, and under the sea.

This report, based on the observations of the delegation and research material obtained in conjunction with its visit, should thus be considered as one part of a concerted committee effort to precipitate public awareness of the importance of sea exploration and legislative action on this matter of urgent national importance. It will be, hopefully, a call to action. If this report promotes concern; if it disrupts complacency; if it commands sufficient interest to encourage a deeper and more searching study of our own limitations and capabilities; and more particularly, if it results in some measure of action; we, its signers, will consider our efforts to have been worth while.

Soviet paths to world power

This report assumes that the expanding Communist effort to master the seas is, at least in part, an attempt to take advantage of the problem of world population explosion and its social, political, and economic ramifications. This "explosion" is not news to the American people. The administration and the Congress are well aware of its magnitude, and the challenge it poses to free people and democratic institutions. But while we in the United States study and discuss the problem, and hope that our free society will, in some way, produce the necessary solutions, the Soviets have taken action.

The U.S.S.R. is finely tuned to world political revolution; its people are but a generation away from internal upheaval, and less that a quarter of a century away from foreign invasion. They sense change, dissatisfaction, and turmoil in the plight of what by the end of this century may be billions of under-fed human beings.

Country	World population by percentage	World food production by percentage
North America	6.6	21.8
Latin America	6.9	6.4
Europe	14.3	22.7
Africa and the Near East	11.5	8.5
U.S.S.R.	7.3	11.5
Far East including China	52.9	27.8
Oceania	.5	1.3

In this potential instability the U.S.S.R. may well be able to achieve political ideals which have so far proved unattainable through nuclear blackmail and overt military conflict. To seize firmly upon these elusive objectives, the Soviet Union is using technology and building its capability rapidly. The U.S.S.R. has marked the paths it must follow. Three of these paths will be through the ocean as they build and exploit their merchant marine, fisheries, and ocean sciences. All of these will help to fill the empty stomachs of underdeveloped nations all over the world. The seas, covering as they do, 71 percent of the earth's surface, will have to provide much of the long-range answer to the population question. We cannot afford to let the Soviets be the only ones with the answers.

Moreover, the race for mastery of the seas has not only the practical ramifications but also the potential propaganda importance of the space race. The ships flying the Red flag do more than transport cargo, net fish or probe the ocean's depths with instruments. Theirs is a strategic political function as well. The Soviet trawlers spreading each day more widely over the high seas along with each new ocean technology development symbolize for the rest of the world the progress which is possible through communism. This is our challenge and we must meet it.

Outline of trip

The delegation consisted of Representative Hastings Keith, Republican, of Massachusetts; and Representative Paul Rogers, Democrat, of Florida; Mr. Allyn Vine, senior oceanographer from Woods Hole

Oceanographic Institution; and David Stang, a member of Representative Keith's staff.

The group arrived in Moscow January 7, 1966, and left January 12. During this time, they visited (formally and informally) with Soviet officials in charge of policymaking and operations in oceanography, fisheries, and merchant marine. Official visits were made to the State Committee for Science and Technology (the principal policymaking body of the Soviet Union for applied research), to the Ministry of Fisheries, and to the Institute of Oceanology, where basic research is done. The delegation gathered specific information and learned much about the attitudes and goals of the Soviets. However, they were disappointed not to be able to visit more facilities. Ambassador Kohler's office in Moscow had requested permission for the delegation to visit 11 places including the Hydrometeorological Institute, the Hydrographic Office and the Baltic shipyards, but permission was not granted.

The delegation was in Poland from January 12 through 14 where they were cordially received by officials of the Ministry of Fisheries and CENTRONOR, the state agency for the promotion of maritime trade. They inspected the shipyards at Gdynia and Gdansk, where many vessels are under construction for the Soviet Union. Many of the observations in this report about Soviet merchant marine and fisheries policy were based on information gained during this part of the trip.

The final stops* of the delegation were the Intergovernmental Oceanographic Commission at UNESCO i Paris and the Food and Agricultural Organization of the United Nations. The information the delegation gathered from these visits has been incorporated into the report.

Soviet Oceanography: A Path to World Communism

Planning

There is no doubt that the oceanographic effort in the Soviet Union is responsive to the directive implied in the 1966 program of the Communist Party in the Soviet Union:

> The Party will cooperate in every way with the further strengthening of the role of science in building the Communist Society through the encouragement of research which opens new opportunities to develop productive forces, by widespread and rapid introduction and use of the latest scientific-technical information, and of the entire system of the study and dissemination of progressive domestic and foreign experience. Science will become a total and direct productive force.

Since World War II the Russians have realized that knowledge of the oceans' secrets would be mandatory if the Red goal of world naval, economic, and maritime superiority was to be achieved. And they have followed this belief up to a great extent.

*Representative Keith returned to the United States through Portugal, where he visited with Ministry of Fisheries personnel and with the chief oceanographer. Inasmuch as this report is primarily concerned with the relative status of the United States and the Soviet Union in marine science and technology, only brief observations concerning Portugal are appropriate here.

Portugal, a maritime nation with a proud history, has managed to sustain modest programs in oceanography, and her effort in the merchant marine is most commendable. This is particularly noteworthy when one considers the size and nature of their economy.

Metropolitan Portugal, in area comparable to the State of Indiana, lands about 600,000 metric tons of fish (worth about $70 million) annually. Its offshore fleet consists primarily of large, modern trawlers fishing off the banks of the northwest Atlantic. Portugal has apparently solved the problem of mixing government and private capital in both vessel construction and operation. Their new $20 million port facility in Lisbon is as modern as any in the world.

Highly directed Soviet planning in oceanography is one of the reasons for their progress. It was our impression that these are their major goals:

1. Rapid and efficient conversion of the results of basic oceanographic research into economic development.
2. World respect for Soviet scientific achievements.
3. Gaining leverage with the international scientific community and making use of the accomplishments of foreign oceanography.
4. International political leverage as a result of assisting nations to establish their own oceanographic programs.

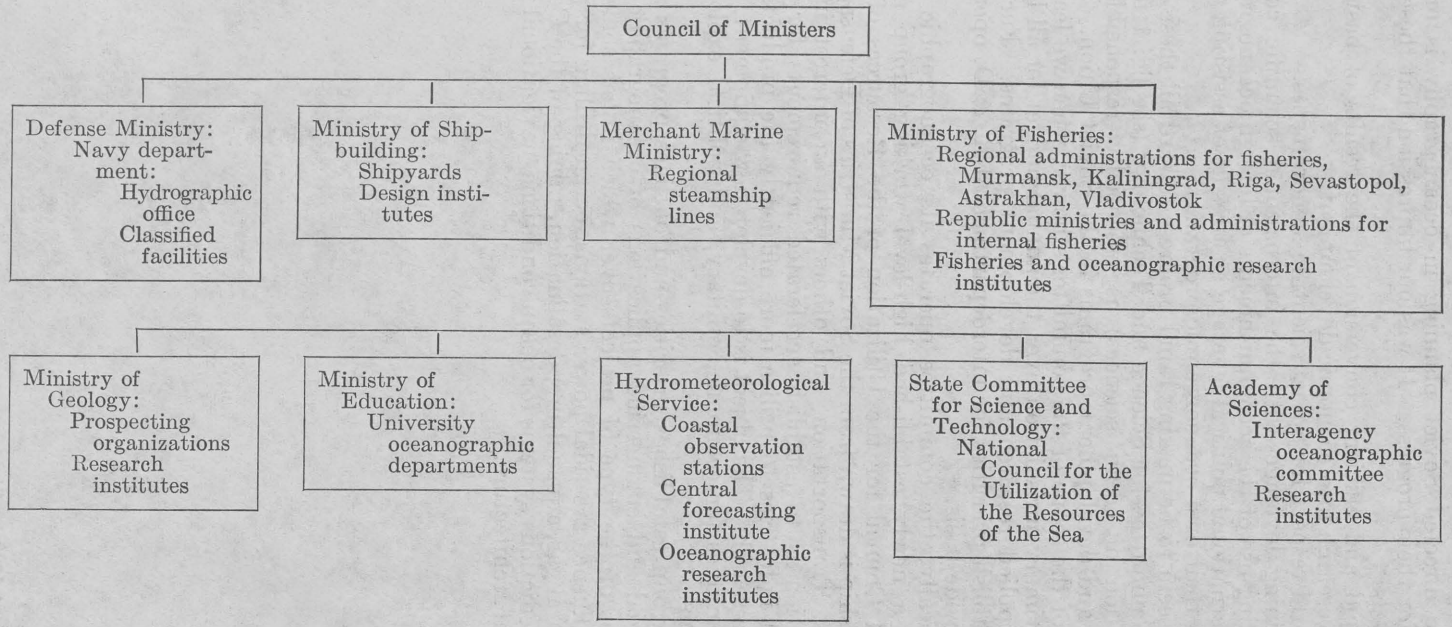
They seem to be making rapid progress toward all these ends.

The Committee for Science and Technology (see fig. 1 for overall organization of ocean sciences) is essentially responsible for all research and development programs in the Soviet Union. We had a glimpse of the scope of the committee's power, when we learned that it had primary jurisdiction over the annual budget for all large scale Soviet applied research and development programs. Furthermore, they establish priorities for interdepartmental R. & D. operations on a nationwide basis.

Specifically, the committee operates its oceanographic programs through a newly established high-level working group called the National Council for the Utilization of the Resources of the Sea. Membership is drawn from the Soviet Ministries of Defense, Geology, Fisheries, Transportation, and others with an interest in the sea. Its function is to establish accelerated requirements for the technological industries to utilize more efficiently the products of basic oceanic research. The object is to develop new equipment, processes, and techniques for economic, military, and political exploitation of the oceans.

This group establishes priorities and outlines programs related to commercial and engineering applications of oceanographic research. Examples of the type of projects over which it has some jurisdictional influence are tidal power stations, ocean drilling for petroleum and natural gas, aquaculture, desalination, mining of the Continental Shelf, predictions systems for ocean conditions, navigational problems, and naval architecture.

FIGURE 1.—*Organization of Soviet shipping, fishing, and oceanographic activities*



The National Council is responsible for coordinating and disseminating the information to subordinate agencies as well as for formulating programs for efficient use of the sea. For instance a new system for ice forecasting along the northern sea route developed by the Hydrometeorological Institute would be passed on to the Ministry of the Merchant Marine Fleet.

Since the planning and application of scientific activities is the major function of the Committee on Science and Technology, it was not surprising that the members were particularly interested in how we bridged the timelag between basic research and technological application. Our answer that private enterprise with its competitive aspects creates incentive to produce new products quickly did not. seem to impress them although they made no particular comments

A counterbalance for the Committee on Science and Technology ie the Academy of Sciences which is on the same level as the committeo though it does not appear to have the same power. Subordinate t- the academy is the Interagency Committee for Oceanographic Research, which is responsible for basic research programs. The acad emy has its own funds for this research.

Institute for Oceanology—Basic research

The one oceanographic research facility that we were permitted to visit was the Institute for Oceanology, located in Moscow. It is subordinate to the U.S.S.R. Academy of Sciences and has the role of carrying out basic research.

Many changes had been made since the institute was visited in October of 1964 by an exchange delegation of U.S. oceanographers. At that time, our ocean scientists observed that the so-called U.S.S.R. Center for Basic Oceanographic Research was outmoded. Its program seemed unimaginative, its facilities poor, and its supposed basic research orientation appeared entangled with many requirements that discoveries be technologically useful.

Since 1964, a new director, Dr. A. Monin, has been appointed and given authority to get the institute's program back on the basic research tack, and now the institute is under considerably less pressure from the Committee on Science and Technology to stress immediate, practical applications. Perhaps this is due to the more or less concurrent setting up of the National Council for the Utilization of the Resources of the Sea to compensate for this lessened emphasis. Now they can get both the benefits of an unconstrained basic research program and a coordinated development program.

The director of the Institute of Oceanology indicated that there is now a greater incentive also for the institute's scientists to submit imaginative proposals. The Soviets appear to have recognized that the foundation upon which future oceanic technological applications can be built is only as broad as today's programs for basic oceanographic research.

It was interesting to learn that the genesis of research projects was more or less similar to the procedure used in this country. The individual scientists submits a paper for a project that he has conceived, and it is then reviewed by a council in the academy. The study is then undertaken if they deem it worthy of support. Our impression was, however, that customarily the projects are done by institute scientists.

The technical papers finally produced by the institute are sent by the National Council for Utilization of the Resources of the Sea to various ministries—for example, the Ministry of the Merchant Fleet receives reports relevant to navigation and shipbuilding, the Ministry of Geology receives papers related to offshore deposits of petroleum and natural gas, and the Ministry of Power is on the distribution list for reports on tidal phenomena perhaps useful for tidal power stations. This was a good specific example of one of the coordinating activities of the National Council.

The Institute of Oceanology today has a fairly free hand in basic research policy—perhaps the freest of all Soviet oceanographic facilities. Their budget has been recently enlarged and they plan to have a new oceanographic ship completed later this year. These facts in combination with the appointment of their new director may mean we will soon see a surge ahead in basic Soviet oceanographic research.

Research vessels

The Soviets have converted many of their ships into oceanographic vessels and built many new ones. Today they have about 200 oceanographic and hydrographic ships conducting research in every ocean of the world. In fact their naval hydrographic vessels have been conducting submarine warfare research off the coasts of the United States, particularly near Florida.

The Soviets are making extensive use of the "ships of opportunity" concept with the aid of both their merchant and fishing fleet. They use such vessels for oceanographic research far more than does the United States. Inasmuch as the Soviet Government owns and controls every vessel flying the hammer and sickle, relatively fewer problems exist in assigning oceanographic missions to ships of the navy, merchant marine or fishing fleet than we meet under our free enterprise system.

The Soviets were interested to learn that Dr. Vine was primarily responsible for the design of the deep submersible, *Alvin*, but were particularly curious about U.S. capability in cable-connected deep-sea devices and whether U.S. scientists felt that such devices were more practical than deep submersibles. They appeared intrigued by the answer that both approaches seemed reasonable in the United States and that the character and qualifications of the personnel in charge of such projects seemed to be at least as important as the method chosen. This same question was asked by various members from the three different organizations the delegation visited. This led us to conclude that policy questions related to the construction of deep-sea research vehicles in the U.S.S.R. were receiving priority attention.

Personnel

Training programs for merchant marine personnel, fishermen, oceanographers, and technicians are carried out in schools called technicoms. Not only are technical subjects taught, but political indoctrination, literature, and engineering courses are also on the curriculum. The emphasis is on applied research for fisheries technologists and ocean scientists.

Trained personnel have vastly increased in recent years. Today the Soviet Union has between 8,000 and 9,000 men and women working full time in the marine sciences. Not including the immense

Russian defense establishment, there are over 1,500 full-fledged professional level oceanographers. By contrast, the United States has less than 1,000 persons in this category and our total manpower in ocean science and technology is estimated at less than 3,000. With their superior numbers of ocean scientists, technicians, and research vessels, the Soviets have the largest capability for collection of oceanographic data of any nation today.

International influence

The Soviet Union effectively utilizes international organizations to serve its national purposes. They participate in many organizations, some of which are concerned with such matters as deciding freight rates or establishing regulations for fishing mesh size. Two groups which have felt the influence of strong Soviet leadership are the Intergovernmental Oceanographic Commission and the Scientific Committee on Oceanographic Research. The present secretary of the latter, Dr. Konstantin Federov, whom we met on our trip, is reportedly a member of the Soviet Communist Party and, incidentally also Director of the UNESCO Office of Oceanography. Obviously this position affords the Soviets a real opportunity to keep ahead, or at least abreast of major developments in the oceanographic field as well as to command respect and influence among world oceanographers.

Another international area of which the Soviets are taking advantage is exchange of students and scientists. Each year foreign students travel to the Soviet Union for enrollment in one of several Russian universities which offers a curriculum in ocean science.

We were interested to learn further that over the past few years, the Soviet Union has stepped up efforts to play host to conferring oceanographers. In May 1965 several international meetings related to the ocean sciences were held in Moscow. At these conferences participants were given warm receptions including tours, banquets, and other entertainment. Presently the Soviets are hosting what will undoubtedly be the largest gathering of distinguished international oceanographers in the history of science, the Second World Oceanographic Congress.

All these international efforts serve to further the Soviet goal of gaining respect for their scientific achievements. This is a parallel effort to the space race, much of which is aimed at capturing the world's imagination. Although the effort is still focused on the scientists, it is similar in intent.

To gain leverage in foreign countries, in the past year the Soviets have also given generous assistance in oceanography to, among other nations, Cuba, Greece, Egypt, India, Poland, and East Germany. For example, the Soviets organized Cuba's new National Oceanographic Institute and have contributed ship operations to Cuban marine scientists.

To achieve the goal of putting to use the results of foreign research, the Soviets use various methods. Oceanographers from the United States who attend international ocean study planning sessions are repeatedly confronted by Russian delegations equipped with well prepared, and stubbornly defended positions. Such well organized and coordinated efforts help the Soviets to use the international agencies to accomplish the research which is of particular interest to Communist objectives. It has been suggested by some scientists that

in these international exchanges the U.S.S.R. gets more than it gives in terms of information.

The Soviet effort makes good use of the international journals. Not only do most of the scientists read English and therefore have access to our journals, but they use these journals to publicize their program and increase its world prestige. Their oceanic achievements receive more publicity than do those of the United States.

Moreover, Soviets apparently are very familiar with Western technology. We have been told that some Soviet oceanographic instruments reveal a startling similarity to Western models.

How does U.S. oceanography compare?

In view of the Soviets' obvious goals and progress toward them, we are apprehensive for the relative status of the United States in oceanography. Comparatively speaking, we seem to have been stumbling along with programs that are very largely uncoordinated, fragmented, and in some instances, overlapping. More than 20 different Government agencies are involved in one way or another with oceanography. All of these agencies collect and use oceanographic data—but the means of collating and distributing it to those with a need to know are woefully inadequate.

Our so-called national oceanographic program is considered by some to be little more than a scorecard compilation of figures, charts, and other tabulated information simply describing what the individual agencies independently plan for themselves.

Although an agency's individual work may well deserve much praise, the lack of overall coordination and planning by the Interagency Committee on Oceanography has long been a major concern. Whether the Committee has power to do much more than they are doing—merely recording, but not directing our oceanographic program—is doubtful. As a result, ocean technology in this country has lacked direction as well as cohesiveness.

This view is not held alone by observers in this country. One prominent Soviet scientist recently commented in a light vein that, "The administration of U.S. oceanography reminds me of a contemporary abstract painting rendered by an ape." While we do not agree with his imagery, we do see that oceanography in the United States has been given little, if any, focus and that it suffers from the lack of a sound statutory base upon which future programs can be built.

Perhaps the new legislation recently agreed upon by House and Senate conferees will provide the solution. The commission set up by this legislation will, we are hopeful, suggest the necessary reorganization measures and Congress will take prompt action on any recommendations.

Who will win the race and how?

Clearly, the greater part of the ocean's resources will belong to the nation best able to harvest them, and whoever controls this vast percentage of the earth's surface will always be a power to be reckoned with. The resources will be needed as our supply of minerals diminishes—and as world population increases and more and more food is required. Moreover, the nation that best knows the seas will have the most effective defense system.

The Soviets plan to be the ones to master the seas, but the United States still has the potential to win this race. We appear, for exam-

ple, to be ahead in basic oceanographic research—a key element in the potential blossoming of imaginative developments. Deep-diving research vehicles, "man in the sea" projects such as Sealab, underwater use of nuclear power, offshore drilling for oil, computer processing of oceanographic data, and instrument design are generally acknowledged areas of U.S. superiority.

However, the United States has a lot of catching up to do in terms of application of our basic research to technology and economic exploitation of the sea. Most of the instruments used on our research vessels, for example, are basically the same as those used a hundred years ago. Moreover, the Soviets, who have long been strong in the applied area are expanding their effort. The new creation of the National Council for the Utilization of the Resources of the Sea with its central power over research and development plans and budget is our proof. At the same time the new powers given to the Institute of Oceanology, and its new director, Dr. Monin, may mean we will be facing a greater challenge in basic research.

THE SOVIET FISHERIES: A SECOND PATH TO WORLD COMMUNISM

A source of protein for hungry stomachs—fisheries

Another path is being blazed by Soviet fisheries. Although most of the 5.6 million tons of fish caught in 1965 by the Soviet fishing fleet is used for domestic consumption, a significant amount is landed in underdeveloped countries. Soviet vessels are unloading more than 2,000 tons of fresh frozen fish every month in Nigeria. These landings are expected to treble to 6,000 tons by January 1967. The same thing is happening in the Congo (Brazzaville), Liberia, Sierra Leone, and Guinea. Over 20,000 tons of fish are unloaded at Ghana from Soviet fishing vessels each year. The U.S.S.R. has offered large fishery development projects to India, Ceylon, and Tanzania, and is currently providing Senegal with a modern tuna fleet and processing industry.

And, of course, Soviet fisheries assistance is being extended to North Vietnam. In May 1965, for example, a North Vietnamese crew arrived in the Black Sea port of Sevastopol to take delivery of the first of three freezer trawlers which the Soviets are building for the Hanoi government. Manned by a crew of 30, the trawlers have a combined daily freezing capacity of 18 to 21 tons of fish and a total hold capability of 600 tons. It is not difficult to translate this catch into military assistance to Vietcong forces fighting our troops in South Vietnam.

Thus the Soviet fishing fleet is an effective arm for extending the U.S.S.R.'s influence throughout the world, particularly to the lesser developed nations.

Soviet fishing vessels engage, of course, in intelligence activities. The large numbers of vessels operating off west Africa enable the U.S.S.R. to keep an eye on what is happening down the Atlantic missile range. Exploratory fishing vessels off California serve the same purpose on the Pacific missile range. Soviet "fishermen" based in Cuba and operating reportedly off Cape Cod and Florida have photographed U.S. military aircraft, and are beginning to threaten fish stocks in waters once dominated by American fishermen.

Administration

The Soviet Ministry of Fisheries, which the delegation visited, plays a major role in the U.S.S.R.'s drive to apply marine science to a practical and political role. The Ministry is headquartered in Moscow and controls all operations, finances, and development planning of the U.S.S.R. fishing industry. The Ministry was formed on October 1, 1965, when the Soviet Government presented to the Supreme Soviet (the U.S.S.R. parliament) sweeping plans for the reorganization of the Soviet industry. It can have enormous power because the state owns and controls all fishing vessels, fish-processing plants, and research institutes, as well as operates fishing ports and shipyards. The Government can directly dictate the diversion of capital investment into fisheries.

The Fisheries Ministry is divided into 11 administrative departments, and 3 major territorial administrative units: 1 each for marine fisheries, inland fisheries, and fisheries conservation and reproduction. The territorial administrations are further divided. In marine fisheries, one "Main Administration" controls each of the fishing operations—the northern, western, Black Sea, Caspian Sea, and Far Eastern. These administrations are controlled directly by the Fisheries Ministry, and in turn control smaller administrative units, or regional administrations. Inland (fresh-water) fisheries and fisheries conservation administrations are also divided into smaller units.

Soviet trade unions bargain with the Fisheries Ministry on employee production norms, and also have a say in hiring and dismissal policies. Reportedly a joint "labor disputes committee" also exists.

Fishery research

Research is the foundation of Soviet fishery development plans. The Soviet Institute of Marine Fisheries and Oceanography (VNIRO) coordinates the work of 22 research laboratories employing over 900 scientists and 3,000 technicians and workers. Leningrad's Research Institute of Lake and River Fisheries handles fresh water research. The All-Russian Research Institute of Pond Fisheries in Moscow handles fresh water and fish farming research. Altogether 135 research laboratories with over 2,000 scientists are engaged in the U.S.S.R.'s fishery research. Moreover, the Soviets are making use of a converted submarine for fishery research.

Soviet fishing production

The Soviets were naturally proud that during the last 25 years the Soviet fishery catch quadrupled from the 1.4 million (metric) tons landed in 1940 to over 5.6 million metric tons landed in 1965 (table 1). Major factors behind this increase are: generous investments in the distant water fleet, the introduction of flotilla fishing where the trawlers are accompanied by freezing and processing vessels, the creation of a large sea research organization, and the expansion of operations into all of the world's oceans. During the 1946–65 period, Soviet fishery investment amounted to an estimated US$4 billion, most of which was used for domestic construction or purchase abroad of new fishing vessels.

In 1964 the Soviet catch of fish and other aquatic products amounted to 5.1 million tons, placing it fourth among the world producers, after Peru, Japan and Communist China. Included in this figure is the

catch of whales, sea mammals and other marine products estimated to total about 640,000 tons (see table 2 for breakdown of catch). The Soviet Union in 1964 caught about 9 percent of all fishery resources landed throughout the entire world during 1964, although her population amounts to only about 7 percent of the world total. Furthermore, the 1964 Soviet catch was up almost 10 percent over the Soviet catch the previous year.

TABLE 1.—*U.S.S.R.: Planned and actual landings of fish, shellfish, and marine mammals, 1950 and 1960–65*

Year	Planned production	Percent of increase over previous year	Actual production	Percent of increase over previous year
1950	(1)	(1)	1,755	(1)
1960	3,380	(1)	3,541	(1)
1961	3,700	9.5	3,724	5.2
1962	3,937	6.4	4,167	11.9
1963	4,220	7.2	4,670	12.1
1964	4,900	16.1	5,121	9.6
1965	5,600	14.3	[2] 5,650	[2] 10.0

[1] Not available.
[2] Estimated.

Source: Compiled from various sources.

Soviet plans for fishery development

The new Soviet 5-year plan (1966–70) for the development of the fishing industry was adopted by the 23d Soviet Communist Party Congress in Moscow this April.

It provides for a 50-percent increase over the 1965 fishery landings by 1970. By then, total fishery production should reach 8.5 million tons. Of this, 7.8 million tons will be fish catches, and the rest whales, other marine animals and aquatic products. Up to 90 percent of the Soviet fish will be caught on the high seas.

Fisheries are a basic industry in the Soviet economy, providing annually more than one-third of the total animal protein consumed in the U.S.S.R. In recent years, even greater emphasis has been placed on increasing the fishery take because livestock production has failed to reach expected goals. The Soviet Union will doubtless continue to develop and expand its fishing industry to provide an adequate supply of high-quality protein for the increasing population and to offset the inability of agriculture to fully meet the protein demands of the Soviet people.

Fishing the seven seas

The delegation concluded from a number of conversations with Soviet officials that the Soviets had plans to move farther and farther south with their fishing fleets. The Gulf of Mexico will see more Soviet activity, and U.S. fishermen have just recently met Soviet fleets off the coast of Oregon. The Soviets plan to depend more and more on large, oceangoing factory and mother ships. Fish can be processed on board, and ships can stay at sea a year or more.

In conjunction with this fishing in the world seas the Soviets are working on ways to forecast locations of schools and migrations of fish from oceanographic and meteorological data. This is a procedure which could well have application in the United States as a kind of fish forecasting service for fishermen, similar to weather forecasting.

TABLE 2.—*U.S.S.R. catch by selected species, 1955, and 1961–64*

[In thousand metric tons]

Species	1964	1963	1962	1961	1955
Marine:					
Cod and allied species:					
Cod [1]	694.9	885.4	783.8	669.7	686.0
Alaska pollock	213.6	128.0	97.2	97.6	9.7
Total cod and allied species	908.5	1,013.4	881.0	767.3	695.7
Herring:					
Atlantic	698.0	569.4	500.7	396.7	224.4
Baltic	85.0	78.6	65.8	63.8	85.6
Pacific	460.5	393.3	320.5	272.8	135.9
Total herring	1,243.5	1,041.3	887.0	733.3	445.9
Sprats	420.0	336.4	270.0	234.0	177.2
Flatfish [2]	186.7	185.0	238.7	273.1	127.2
Ocean perch	364.4	184.1	111.5	123.7	31.6
Salmon, Pacific	49.7	84.1	64.2	84.8	172.4
King crab	46.2	42.5	41.4	38.7	37.4
Other marine fish	849.6	736.8	758.7	574.8	237.6
Total marine	4,068.6	3,623.6	3,252.5	2,829.7	1,925.0
Fresh water [3]	407.2	353.6	364.0	420.3	570.0
Total, fish and shellfish	4,475.8	3,977.2	3,616.5	3,250.0	2,495.0
Other marine products [4]	644.2	692.8	550.5	474.0	242.0
Total Soviet landings	5,121.0	4,670.0	4,167.0	3,724.0	2,737.0

[1] Includes hake, haddock, and related species.
[2] Includes sole, halibut, and related species.
[3] Principally carps, pikes, pike-perch, and whitefishes, including sturgeons.
[4] Includes whales, seals, seaweeds, and other aquatic products.

Source: Food and Agriculture Organization Yearbook of Fishery Statistics, 1956, 1964.

Farming the sea

The delegation asked what techniques were being applied to the harvesting of food products, other than fish, from the seas. We were told that the Soviet Union is engaged in a comparatively small operation on its southern Pacific coast for the systematic growth of seaweed. In the same area they grow sea cabbage, which they mix with tomatoes in a stewed concoction and can and sell for domestic consumption.

Pollution: A tough approach

However, as the industrialization of the Soviet economy continues, they are having trouble (as is the United States) with powerplants and pollution. Due to the pollution problems in the Caspian Sea, many shipments to foreign purchasers of caviar are being returned to the Soviet Union with the complaint that the sturgeon roe has a bad taste. For that reason a special institute for conducting sturgeon research has been established in Astrakhan, which is located on the River Volga close to its entrance into the Caspian Sea.

The Soviet Government is also beginning to crack down on industrial facilities which contribute to the increased pollution of water. It was reported that recently the manager of a large chemical plant was jailed for dumping improperly processed pollutants into a river. Wastes from his factory apparently had killed hundreds of thousands of sturgeon fingerlings.

Elevators for fish

Another problem facing Soviet fisheries has been the influence of nydroelectric power dam construction on fish like salmon which go up-

stream to spawn. The obstacle presented by the dams for these fish has been almost solved through the construction of "fish ladders." Within the last year the dam at Volgagrad has been used for an interesting innovation, known as a "fish elevator." The fish are attracted to swim against an artificial current at the bottom of the dam. When a sufficient number move into position, a locklike slat is lowered creating a wall that isolates the fish inside from others downstream. Then the elevator lifts the fish up to the top of the dam and releases them to swim upstream. The process is repeated for as long as the fish attempt to move upstream. After the fingerlings develop and began to move downstream, they pass through the turbines at the dam without harm.

Fish breeding

One of the Soviets made a speech to the delegation stating that "We can no longer consider the high seas as hunting grounds, but must view them as farming grounds." A conversation then turned to the the methods the Soviets were using to do fish farming—modification of the environment and artificial breeding. The delegation's hosts indicated that there are a number of artificial breeding plants in the Caspian and Ural Seas where experiments are being made to enhance a more successful spawning cycle. They indicated that the work of these plants is being expanded.

Related to the artificial breeding facilities are a growing number of "incubating" stations, which serve as a new home for transplanted species of fish. Several examples of fish transplants were given: pink salmon eggs, king crab eggs, baby king crabs. Also, 300 mature crabs were just taken from the far eastern Sea of Othotsk and the Bering Sea, then successfully transported to the Barents and White Seas (near Norway and northern Russia). It is noteworthy that the salmon and crabs reproduced at a better rate than they had in the Far East.

Fish protein concentrate

One of the subjects to which the delegation gave considerable attention was that of fish protein concentrate (FPC), and fishmeal.

The Soviets produce a fishmeal from "trash" fish plus the residue (heads, guts, fins and bones) of certain edible varieties. The meal is used as fertilizer and livestock feed.

The delegation indicated that U.S. research had resulted in processes being devised which make use of the entire fish to produce a sanitized, deodorized, and tasteless end product which was scientifically considered safe for human consumption. When the delegation indicated, however, that the U.S. Food and Drug Administration had prohibited human use, not on scientific, but rather on esthetic grounds, the Soviets were amazed.

We later learned that the Soviets have been deftly turning the situation to their own advantage for some time. In a sort of "heads we win, tails you lose" manner, the Soviets have pointed out to some groups that we have producers who are shipping FPC abroad even though it is officially considered too polluted and filthy for U.S. citizens to eat. At the same time, however, pointing to the Peruvian fishmeal industry which is largely backed by U.S. money, the Communists have claimed that our capitalistic greed for profit makes us

deal in this item, fit only for fertilizer and poultry feed, instead of in human food.

At present, the Russians appear to have done less than we have in terms of research and development of a fish-based dehydrated food suitable for human consumption. If they should get into large-scale production of such an inexpensive, protein-rich food as FPC before we do, they could gain considerably greater leverage in international diplomacy. The signators to this report strongly urge that we do all in our power to enter this field first. If the United States can get into large-scale fish protein concentrate production, it will provide a great stimulus to the lagging U.S. fishing industry, and give this nation considerable leverage in international diplomacy since the superior U.S. product would find ready market in the world's underfed nations.

Aid to lesser developed nations

A vital area of Soviet combined foreign policy and "business" is in their program of assistance to the newly developing nations in many parts of the world.

At the present time the U.S.S.R. is helping Senegal expand its fishing by providing the young nation with a modern tuna fleet and processing industry. In turn, Soviet fishing, merchant, and oceanographic ships are afforded special benefits while calling at Senegal's port of Dakar.

Ghana has the most rapidly developing domestic fishing industry in Africa largely due to massive practical aid from the U.S.S.R. In addition, 20,000 tons of fish per year are being landed in Ghana from Soviet fishing vessels.

Soviet fishermen are landing more than 2,000 tons of fresh frozen fish each month in Nigeria where a source of protein is desperately needed. These landings are expected to increase to 6,000 tons per month by January 1967. The Soviets are also landing fish in the Congo (Brazzaville), Liberia, Sierra Leone, and Guinea.

The U.S.S.R. is building a modern fishing harbor for Egypt at Alexandria on the Mediterranean Sea and another at Ras Banas on the Red Sea.

The Soviets have also promised fisheries assistance to Tanzania, Ceylon, India, and other countries.

Thus it is easy to see that foreign aid in the form of fish and fisheries is a diplomatic tool of the Soviets. But the United States can go the Soviets one better by getting into the fish protein concentrate business

How does the United States compare?

The United States during 1965 imported 55 percent of its fish or 2.8 million tons including $505,000 worth of Soviet fishery products. In effect, every other fish in an American frying pan is imported. The fact that the entire U.S. catch was about 3.3 million tons less than the Soviet's is not half so discouraging as the fact that during the past 20 years the Soviets have tripled their fish catch while the United States annual total has actually declined.

Several factors have contributed to the U.S. loss of stature as a world leader in the fishing industry. One of these is the great number of antiquated vessels and outmoded equipment used by our fishermen. Competition is difficult when other nations are using newer, larger, and more efficient vessels which permit a greater volume of fish to be

caught per man-hour. Large factory vessels and mother ships allow these other countries to fish throughout the world oceans. In addition, the increasing use of advanced methods by nations exporting fish to the United States has tended to keep the U.S. price of fish down. Foreign labor is cheaper. Accordingly it is more difficult for many of U.S. fishermen to earn a significant profit. This situation has discouraged younger Americans from pursuing fishing as a career. Also, in the U.S. fishing industry there is reluctance to increase capital investment in newer vessels and more modern techniques. Added to this is the high cost of new vessels in the United States; for instance, a fishing boat which would cost $200,000 in Japan or one of the Scandinavian countries usually costs $350,000 or more in the United States.

Relief to the fishing industry

The Federal Government has attempted to alleviate the situation by implementing a number of programs to assist our fishermen. The Congress already has passed legislation establishing programs for loans to fishermen, vessel mortgage and insurance measures, and fishing vessel construction subsidies. The Bureau of Commercial Fisheries, with its regional offices and research projects, has been of invaluable assistance to United States fishermen. But the U.S. fishing industry needs much more help, not only for the purpose of increasing the fish catch for domestic consumption, but also to enable the United States to meet potential exports of fish protein to the many underfed nations of the world. The use of advanced techniques should be encouraged along with increased research. Our fishing industry is moribund and on the decline. It is our responsibility to inject new life into it and meet the Soviet challenge.

THE SOVIET MERCHANT MARINE: A THIRD PATH TO WORLD COMMUNISM

Fourth arm of defense

The Soviets recognize that the merchant marine is a major instrument of power. Over 1,200 ships of the Soviet merchant fleet deliver military supplies ranging from missiles and patrol boats, to hand grenades and machineguns. They deliver fuel for industry and for tanks. They deliver trucks and roadbuilding equipment to develop inland transportation networks. They deliver prefabricated factories, tractors, and combines. Soviet ships carry military troops and scientific and industrial advisers to far continents. They return ofttimes with students.

Soviet passenger liners are also being used to collect the hard currency of wealthy European and Canadian tourists. The Red-flag cruise ship, *Alexander Pushkin,* is soon expected to begin sailings between Leningrad and Montreal via European ports. A sister ship, the *Ivan Franko,* which began its tourist trade last year, is now about to start a year's charter with the French vacation enterprise, Club Mediterranée, to carry Europeans on low-cost cruises to the Mediterranean and the Caribbean. Another Soviet passenger ship will take British schoolchildren on cruises to Scandinavian countries. These arrangements besides providing foreign currency, is profitable advertising for Soviet communism.

According to Victor Bakayev, Minister of the Soviet merchant fleet, Red ships call at 600 ports in 91 different countries, only 13 of which are Communist. Fifty-one of the countries are underdeveloped.

Many ships built in Poland

The delegation had the unique opportunity of inspecting the Gdansk and Gdynia, shipyards in Poland, which built many merchant and fishing vessels for the Soviet Union. One of these yards alone launched more ships in 1965 than all the yards in the United States constructing similar type vessels.

Since World War II Polish shipyards have launched over 2.5 million tons, their biggest customer being the U.S.S.R. Over 85 percent of the vessels built in the Gdansk yard during 1965 were for the Soviet Union. The Soviets apparently are satisfied with the work being turned out since Poland now has a Soviet order—for delivery between 1966 and 1970 of 175 ships totaling 1.5 million tons. This order includes fish factory ships of 10,000 tons, tankers of 20,000 tons, general cargo ships of 12,500 and 6,500 tons, timber carriers of 5,000 tons, ore and coal carriers of 23,000 tons and trawlers and oceanographic vessels of varying tonnages.

Growth of the Soviet fleet

It became evident to the delegation that the massive maritime buildup currently underway in Russia will soon provide her with a large enough fleet to prosecute successfully a military war, or economic cold war.

As a result of its 7-year plan, the Soviet Union in 1960 strengthened its 11th-ranked fleet to 6th place in 1965—with a present fleet of over 8½ million deadweight tons. The next Soviet target is to triple the size of this increase during the next 4 years. The Soviet goal for 1980 is to have developed a fleet of over 20 million tons—the equivalent of the huge British merchant marine of today.

As of October 31, 1965, the U.S.S.R. had 464 merchant ships of 1,000 gross tons or more, either under construction or on order. Today over 24 percent of the total number of ships on order or under construction throughout the world are for the Soviets. Shipyards in some of our most closely allied nations—Britain, Japan, Italy, Holland, Finland—are hard at work trying to fill Russian orders. In 1965, the Soviets accepted delivery of 100 new ships. Her total expenditures for ship construction exceeded $600 million.

Merchant marine technology

The delegation learned that the Soviet's own yards are also hard at work. Their shipbuilding and repair industry is being expanded and existing facilities are being modernized and enlarged. Inland waterways are undergoing tremendous development to provide both hydroelectric power and greater navigable depths for the expanding fleet. The fleet itself is being rapidly upgraded with modern vessels, including pusher towboats patterned after more advanced river craft used in the United States. The Soviets are also developing totally automated ships, able to navigate without pilots.

Seaport development is being accelerated, particularly in the Black Sea, where draft limitations have prevented maximum use of today's larger vessels. Automation and mechanizations of port cargo-handling equipment is being accomplished rapidly. The delegation was interested to learn that a computer center went into operation recently in the Baltic Shipping Corp. It is among the first such centers to be put to use for the Soviet merchant marine. The center

will help even out the distribution of freight among ports, plan the use and routing of ships to achieve the least possible cost, and help resolve other problems connected with efficiency of ports and ships.

Icebreaker construction is being accelerated to provide a virtual armada that will permit nearly year-round access to northern Soviet ports. These ships—some of which may be atomic powered—will open up ice-locked ports in the Arctic and may also prove useful in trade with Canada via the St. Lawrence River.

Maritime goals defined

What reasons lie behind the Soviets' big push to develop the largest merchant fleet in the world? In the words of Bakayev, U.S.S.R. Minister of the Merchant Marine, "to gain control of the seas." More explicitly, Soviet maritime goals have been defined as:

(1) To free the U.S.S.R. from reliance on foreign-flag ships;

(2) To exert a decisive influence on the world level of maritime freight rates;

(3) To become a major carrier of the commerce of other nations.

Independence from foreign-flag ships

The first of these objectives is being achieved by the Soviet crash program of new ship construction. The U.S.S.R. expects to be carrying 75 percent of its trade in Red-flag ships by the end of this year. The United States, presently the world's largest trading nation, carries less than 9 percent of its total trade in ships flying the American flag. World War II saw a shipbuilding boom as a result of the war effort. During the postwar period, the United States carried more than 50 percent of its trade in American bottoms. However, the average life span of a ship is 20 to 25 years. Today a large percentage of our ships are obsolete, as well as simply worn out.

Influence on maritime freight rates

The Soviets are attempting to achieve a position of influence in the maritime field. They have joined in pacts with certain active European nations regarding minimum freight rates. Meanwhile they are building up the size of their fleet and eventually may achieve sufficient power to have a serious effect on the future of these other maritime nations. The need to reap profit in the face of rising costs might force some of their competition out of business. This would open the field of international shipping to Russian domination. In order to accommodate the anticipated increase in commerce, Russia is concentrating on merchant marine expansion. Statistics reveal that with recent increases in volume of international trade, the share of Soviet shipping has gone up proportionally: a fourfold increase in 1965 over the 13,500,000 tons of goods shipped in 1958. As Bakayev himself asserted, "We are determined to deliver the bulk of foreign trade turnover on our own ships."

Eventual Communist bloc domination

Russia seeks to so dominate the sealanes that the services of Communist bloc shipping will be required by those nations that have seen their merchant fleets vanish or become unable to compete with Soviet freight rates. Communist dominance of shipping also could enable Russia and her satellites to withhold ocean freight services from any nation out of favor with Kremlin policies. Two present indications

of this trend are seen in the large number of Soviet ships carrying Canadian wheat from Canadian ports and Cuban sugar from Cuban ports.

Shipping agreements

Another example of Soviet effort to attain leadership in the world maritime market is through its shipping agreements with Communist bloc nations. Soviet, Polish, and Czech ships are steaming on joint schedules between Rumanian ports and the Middle East. Polish, East German, and U.S.S.R. merchant ships sail to West Africa from East German ports. Between the Baltic and the Caribbean ply vessels from the Soviet Union, East Germany, Czechoslovakia, Poland, and Hungary. The delegation saw all these trade routes—plus many others—depicted on a large world map at the Soviet Maritime Museum in Moscow.

Military assistance

In several instances, if results are to be measured in rubles alone, the Soviet merchant marine is being used for less than economically profitable purposes. For instance, within the past few years the U.S.S.R. has used its merchant ships to deliver arms to many countries, including North Vietnam, Cuba, Egypt, Syria, India, and several nations in Latin America and Africa. These military cargoes are reported to consist of bombs, missiles, fighter aircraft, tanks, trucks, patrol boats, land and sea mines, hand grenades, machineguns, rifles, pistols, ammunition, and other war equipment. Some Soviet ships have even been observed towing floating drydocks to distant nations.

The phenomenal buildup of missiles on the island of Cuba in 1962 could never have been accomplished without the huge shipping capacity of the Soviet merchant fleet.

Foreign aid

The Soviet merchant fleet transports goods which are used as part of its international assistance programs. Prime recipients of Soviet cargoes are essentially the same underdeveloped nations receiving fish from the Soviets. The Soviet goods are helping these nations help themselves in building their own industrial and agricultural economies.

With these cargoes from the Soviet Union many emerging nations are building dams, highways, harbors, manufacturing plants, farms, timber mills, skyscrapers, and libraries. Soviet tankers and freighters deliver petroleum, cement, steel prefabricated factories, textiles, tractors, combines, and other farm equipment, trucks, cars, bulldozers, lumber, and books. The Soviet merchant flag flying above cargo, tanker, and passenger ships appears at ports in nearly every country of the world. Along major world sea routes merchant seamen of every nation pass new ships with a bright hammer and sickle painted on the smokestacks.

How does the United States compare?

Although the Soviets are giving top priority to their programs, designed to gain control of the seas, our merchant marine is on the decline.

The statistics are alarming:

U.S. shipyards began 1966 with 41 merchant ships on order. At the end of 1965 the Soviets had 464 merchant ships of over 1,000 gross tons on order.

About 70 percent of all U.S.-flag cargo ships is more than 20 years old—20 years is considered a reasonable lifetime for a ship—while 80 percent of the Soviet commercial fleet is less than 10 years old.

During 1965 the Soviets accepted delivery of 129 new ships, totaling 1,162,800 d.w.t., while the United States took delivery of only 16, a total of 234,500 d.w.t.

In 1965 the U.S.S.R. spent over $600 million for new ship construction. The U.S. figure came to less than one-quarter of that.

The Maritime Administration lists the United States as having the largest merchant marine in the world. It lists U.S. merchant marine ships of over 1,000 gross tons as numbering 2,449 and conservatively credits the Soviets with owning only 1,261. But subtract the U.S. inoperative, rusty, reserve fleet which is lying in mothballs and compare that with the Soviet figure. Operating Russian ships not only outnumber our own by several hundred, but are at least a generation younger and thus more modern by present-day standards.

U.S. maritime policy

In the meantime, despite the Soviet merchant marine threat, the Maritime Administration's budget for fiscal year 1967 plans for construction subsidies for only 13 ships. The so-called merchant ship replacement program which got underway in 1958 is already more than 90 ships behind contractual schedule.

Vietnam: Is our shipping adequate for the emergency?

During time of war, more than ever, a nation needs a strong merchant marine. The merchant marine has often been called our fourth arm of defense, but today, it can be termed our "withered arm of defense." So pitiful is U.S. shipping capacity that it has become necessary for us to charter foreign vessels to carry war materials to Vietnam.

Is the Defense Department guilty?

The constantly recurring question is, "Has the Defense Department been derelict in assessing the need for shipping capacity in time of emergency?" Even the Chief of Naval Operations has raised the question of whether the merchant marine has the ability to handle emergency requirements.

The recent attempt to rejuvenate the mothball fleet of World War II does not really answer the question. As Chairman Garmatz pointed out, "The ship repair yards throughout the country have been overloaded with ships broken out of the reserve fleet to meet the emergency and there is grave doubt concerning the effectiveness of our reserve fleet program in the light of the breakout experience." Merchant marine officers are reluctant to sail on these unreliable antiquated vessels of pre-World War II design. Moreover their slow speed makes them good targets for even the most sluggish warships. Fortunately for the United States, the war in Vietnam is not being fought on the sea, but the danger that our sealift of military supplies constantly breaks down is a clear one.

The manpower shortage

Not only do we need more ships to maintain our fleet, but there is a shortage of licensed merchant marine officers. This shortage will continue to grow more severe whether we use our reserve fleet or build

new ships. Approximately 1,000 licensed officers are required to maintain our present fleet under normal conditions. All maritime schools combined will graduate less than 550 men this year. Moreover, the average age of the licensed seagoing work force is about 50 years, and the average is going up. About 44 percent of the work force will be in the retirement category within the next 3 years.

U.S. reliance on foreign shipping

Despite the widening war in Vietnam, many top officials feel that, due to the high cost of shipbuilding and maintenance, it is wiser and more economical to continue to rely on foreign shipping.

We must remember, however, that our exports and imports did slow down, and, in some cases, stop prior to World Wars I and II when foreign ships were withdrawn for political reasons. It seems clear that we cannot depend even on allies always to support us in world affairs. The results of doing so can be disastrous. In 1914 we were obliged to wait for foreign ships while our piled-up commodities perished. The price of transporting a bale of cotton from the United States to the United Kingdom rose from $2.50 to $60, while the price of transporting a bushel of wheat rose from 5 to 60 cents. Have we still not learned our lesson?

Today, as the leading trading nation of the world, the United States should be concerned about the movement of its goods to foreign markets. The constant threat in both hemispheres should be strong enough stimulation for our Nation to keep the American merchant marine strong. Only in this way can U.S. manufacturers and farmers be assured unhampered movement of their goods throughout the world market.

The Soviet Union's merchant fleet of 8½ million tons is greater in size today than the active U.S. merchant fleet. By 1971, with a projected 10 million tons to be added to its fleet, Soviet superiority over the United States may be 2 to 1.

Dare we let this happen? The call to action has been sounded. Continued inaction in the coming days may affect the future of not only the United States, but the entire free world as well.

CONCLUSIONS

The programs of the U.S.S.R. to gain superiority on the sea are (1) well planned both from the short- and the long-range point of view; (2) encompass political, military, economic, and scientific objectives; (3) the organizations with responsibility to implement them are competently staffed and well coordinated. In short, we conclude that the entire Soviet maritime policy has already gone a long way toward achieving supremacy at sea, and unless effectively challenged by the free world, can be expected to achieve this strategic objective well before the end of this century.

The emergence of the Soviet Union as a major maritime power is no accident of history. All indications point to the fact that since World War II, and especially since the Korean conflict, the Soviet Union has carefully planned an extension into all the oceans of the world. The U.S.S.R. has a navy second only to ours. The Soviets are effectively exploiting the ocean's resources. They are using their strengthened maritime position to further Communist political objec-

tives. The fruits of heavy Soviet exploitation of the oceans—protein rich food—can be offered to hungry countries, in exchange, perhaps, for sympathy and support in international forums, especially the United Nations. We can expect even further efforts as Soviet ocean-ranging fleets move into waters off South America, where population growth could explode into political and economic upheaval.

What can the United States do to meet this challenge? The Merchant Marine and Fisheries Committee and its Subcommittee on Oceanography are anxious for this urgent problem to be debated more fully in the Congress. In this way, we intend to promote wider discussion of the fundamental issues and increase the Nation's awareness of our need to maintain mastery at sea. Both Houses of Congress know that governmental leadership is needed to meet the challenge.

Our committee has been considering a number of approaches to better coordinate and manage our national efforts with respect to oceanography, fisheries, and the merchant marine. We seek a national program of ocean exploration that will command the attention and support approaching that presently enjoyed by our space effort. It is hoped that this report will give greater impetus and a greater sense of urgency to the legislation needed to reestablish the U.S. leadership among the maritime nations of the world.

But governmental leadership needs a concerned, well-informed public for support. We are certain that Congress and the administration can help reawaken the consciousness of the Nation to the vital stake we continue to have in the seas. Once a national priority is established, we are confident that the U.S. system of private enterprise, with strong support at the State and Federal levels, will enable us to maintain our maritime supremacy without the terrible cost the people of the Soviet Union have had to pay in terms of their individual liberties.

Shortly before his untimely death, our late President Kennedy concluded a formal address with this statement:

> The sea is all around us. It is part of our lives. We must know about it. We must master it. I am glad the United States is committed to this great effort.

We need now only to implement this commitment.

RECOMMENDATIONS

The following are some of the steps we believe this country should take to meet the Soviet challenge on the seas.

Oceanography

Enact appropriate legislation to give stronger central direction and greater coordination to our oceanographic program on a permanent basis.

Increase our personnel in the ocean sciences. One way to accomplish this is through the sea-grant college bill now before Congress. The education we provide today will determine the shape of tomorrow's oceanographic program.

Encourage relatively more emphasis on applied research and ocean engineering than we have had in the past.

Make greater use of ships of opportunity for oceanographic and fisheries research.

Improve systems for dissemination of results of oceanographic research to relevant government agencies and the general public. Our free and highly competitive enterprise system is one of the strengths of our society and we should make the best use of it to further our oceanographic program.

Share the processes and products of our research and development with the free nations of the world.

Use the products of our oceanography to help us help the developing nations of the world.

Allocate more funds to our total effort in oceanography. We are spending vast sums for the space race—the oceanography effort could, in our opinion, furnish more immediate benefits—and certainly a better return in longrun economic benefits.

Merchant marine

Stop neglecting our merchant marine and recognize that it has a major role to play as part of our national transportation system and in our national defense. Our neglect becomes more serious in the light of the Soviet buildup and progress toward their goal of mastering the seas. We must give our merchant marine the support it deserves or we may one day find ourselves having to depend on Soviet shipping.

Give immediate attention to solving the policy dispute within the Government so that we can proceed with a program to support our merchant marine.

Fishing

In order to stimulate vessel and equipment product development, we should institute a system of tax incentives for fishing vessel construction and modernization.

Do further research in fishery technology.

Proceed rapidly with necessary measures to get fish protein concentrate into large-scale production in order to meet the demands of a hungry world as well as to give a boost to our fishing industry.

To protect our fisheries for future generations, we should step up our national research effort in conservation and aquaculture techniques.

For conservation purposes in particular, adopt (as have the Russians) a 12-mile limit to protect our fisheries.

Inasmuch as conservation is handicapped without adequate information, we should improve our data collection on fish populations and migrations.

Strive to develop public support for our participation in international conferences to settle problems of conservation of resources of the high seas.

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